

National Assessment of Oil and Gas Fact Sheet

Assessment of Undiscovered Oil and Gas Resources in Jurassic and Cretaceous Strata of the Gulf Coast, 2010

Using a geology-based assessment methodology, the U.S. Geological Survey estimated means of 147.4 trillion cubic feet of undiscovered natural gas, 2.4 billion barrels of undiscovered oil, and 2.96 billion barrels of undiscovered natural gas liquids in Jurassic and Cretaceous strata in onshore lands and State waters of the Gulf Coast.

Introduction

The U.S. Geological Survey (USGS) recently completed an assessment of the undiscovered oil and gas resources in Jurassic and Cretaceous strata of the onshore areas and State waters of the Gulf Coast (fig. 1). The assessment is based on

geologic elements of a total petroleum system (TPS), including characterization of hydrocarbon source rocks (source-rock maturation, hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy and petrophysical properties), and hydrocarbon traps (trap formation, timing, and seals). Using these criteria, the USGS defined an Upper Jurassic-Cretaceous-Tertiary Composite TPS for conventional oil and gas resources that extends around the entire Gulf of Mexico, including portions of both the United States and Mexico. The present assessment of undiscovered conventional oil and gas resources includes only that portion of the TPS that lies onshore and in State waters of the United States (fig. 1). This area extends geographically from the southwest boundary of the Western Gulf Province (47) on the Texas-Mexico border



Figure 1. Map of the Gulf Coast region showing the part of the Upper Jurassic-Cretaceous-Tertiary Composite Total Petroleum System that is onshore and in State waters of the Gulf Coast of the United States (blue line indicates onshore boundary in the United States). Province boundaries defined by the U.S. Geological Survey are indicated by red outlines.

Table 1. Gulf Coast assessment results.

[MMBO, million barrels of oil; BCFG, billion cubic feet of gas; MMBNGL, million barrels of natural gas liquids. Results shown are fully risked estimates. For gas accumulations, all liquids are included as NGL (natural gas liquids). F95 represents a 95 percent chance of at least the amount tabulated; other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. TPS, total petroleum system; AU, assessment unit. Gray shading indicates not applicable]

Total Petroleum Systems (TPS) and Assessment Units (AU)	Field Type	Total Undiscovered Resources											
		Oil (MMBO)				Gas (BCFG)				NGL (MMBNGL)			
		F95	F50	F5	Mean	F95	F50	F5	Mean	F95	F50	F5	Mean
Upper Jurassic-Cretaceous-Tertiary Composite TPS (50490100)													
Norphlet Salt Basins and Updip AU (50490102)	Oil	13	48	106	53	8	31	73	34	1	2	6	3
	Gas					371	1,579	3,709	1,758	12	53	135	61
Norphlet Mobile Bay Deep Gas AU (50490103)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					208	1,175	4,029	1,514	0	2	7	3
Norphlet South Texas Gas AU (50490104)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					0	153	748	233	0	5	27	8
Smackover Updip and Peripheral Fault Zone AU (50490105)	Oil	27	76	136	78	29	85	169	90	2	7	15	7
	Gas					46	151	304	160	4	15	32	16
Smackover Salt Basin AU (50490106)	Oil	21	75	149	79	25	90	199	98	2	7	17	8
	Gas					265	889	1,693	926	32	112	235	120
Smackover South Texas AU (50490107)	Oil	6	22	51	25	7	25	62	28	1	2	5	2
	Gas					203	699	1,419	744	19	68	151	74
Haynesville Western Shelf-Sabine Platform Carbonate Gas AU (50490116)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					143	541	1,180	587	2	8	19	9
Haynesville Shelf Carbonate and Sandstone Oil and Gas AU (50490117)	Oil	7	27	64	30	9	37	95	43	1	3	9	4
	Gas					9	27	75	32	0	1	3	1
Bossier East Texas Basin Sandstone Gas AU (50490118)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					590	2,512	5,806	2,765	8	34	86	39
Bossier Louisiana-Mississippi Shelf Edge Sandstone Gas AU (50490119)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					211	945	2,368	1,072	3	13	35	15
Knowles-Calvin Gas AU (50490120)	Oil	0	0	0	0	0	0	0	0	0	0	0	0
	Gas					621	3,069	7,382	3,423	6	30	78	34
Sligo-James Carbonate Platform Gas and Oil AU (50490121)	Oil	11	45	106	50	31	132	336	151	1	6	16	7
	Gas					167	587	1,279	640	5	17	41	19
Lower Cretaceous Basinal Gas AU (50490122)	Gas	Not quantitatively assessed											
Sligo Sandstone Gas and Oil AU (50490123)	Oil	3	9	19	10	1	4	9	4	0	0	0	0
	Gas					140	440	803	453	1	4	9	5
Greater Glen Rose Carbonate Shelf and Reef Gas and Oil AU (50490124)	Oil	23	71	153	78	78	260	602	290	4	13	32	15
	Gas					252	720	1,480	778	7	22	50	25
Albian Clastic AU (50490125)	Oil	11	35	69	37	9	31	67	33	0	1	3	1
	Gas					39	116	207	119	1	3	6	3
Updip Albian Clastic AU (50490126)	Oil	0	1	3	1	0	0	3	1	0	0	0	0
	Gas					0	3	15	4	0	0	0	0
Fredericksburg-Buda Carbonate Platform-Reef Gas and Oil AU (50490127)	Oil	10	37	83	40	26	100	246	113	1	5	12	5
	Gas					120	466	1,041	509	2	8	20	9
Eagle Ford Updip Sandstone Oil and Gas AU (50490128)	Oil	41	136	253	141	53	184	381	197	1	4	8	4
	Gas					86	289	571	305	3	11	24	12

Conventional Oil and Gas Resources

Table 1. Gulf Coast assessment results.—Continued

[MMBO, million barrels of oil; BCFG, billion cubic feet of gas; MMBNGL, million barrels of natural gas liquids. Results shown are fully risked estimates. For gas accumulations, all liquids are included as NGL (natural gas liquids). F95 represents a 95 percent chance of at least the amount tabulated; other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. TPS, total petroleum system; AU, assessment unit. Gray shading indicates not applicable]

	Total Petroleum Systems (TPS) and Assessment Units (AU)	Field Type	Total Undiscovered Resources											
			Oil (MMBO)				Gas (BCFG)				NGL (MMBNGL)			
			F95	F50	F5	Mean	F95	F50	F5	Mean	F95	F50	F5	Mean
Upper Jurassic-Cretaceous-Tertiary Composite TPS (50490100), continued														
Conventional Oil and Gas Resources	Austin-Tokio-Eutaw Updip Oil and Gas AU (50490130)	Oil	6	19	34	20	1	3	6	3	0	0	0	0
		Gas					17	47	92	50	0	1	2	1
	Austin-Eutaw Middip Oil and Gas AU (50490131)	Oil	10	41	95	45	28	118	300	135	2	10	27	12
		Gas					109	477	1,192	542	10	46	124	54
	Austin Downdip Gas AU (50490132)	Oil	3	11	32	13	10	43	130	53	1	4	14	5
		Gas					406	1,429	3,013	1,542	46	167	385	185
	Post-Ouachita Successor Basin AU (50490201)	Gas	Not quantitatively assessed											
	Triassic Basins AU (50490202)	Gas	Not quantitatively assessed											
	Total Conventional Resources		192	653	1,353	700	4,318	17,457	41,084	19,429	178	684	1,633	766
Continuous Oil and Gas Resources	Haynesville Sabine Platform Shale Gas AU (50490161)	Gas					44,268	59,735	80,604	60,734	22	35	55	36
	Haynesville Greater Gulf Basin Shale Gas AU (50490162)	Gas	Not quantitatively assessed											
	Mid-Bossier Sabine Platform Shale Gas AU (50490163)	Gas					2,879	4,870	8,240	5,126	5	10	18	10
	Bossier Greater Gulf Basin Shale Gas AU (50490164)	Gas	Not quantitatively assessed											
	Maverick Basin Pearsall Shale Gas AU (50490165)	Gas					3,386	7,764	17,801	8,817	0	0	0	0
	Greater Gulf Basin Lower Cretaceous Shale Gas AU (50490166)	Gas	Not quantitatively assessed											
	Eagle Ford Shale Oil AU (50490170)	Oil	341	758	1,687	853	625	1,486	3,533	1,707	12	29	74	34
	Eagle Ford Shale Gas AU (50490167)	Gas					23,470	46,150	90,747	50,219	851	1,809	3,842	2,009
	Austin Pearsall-Giddings Area Oil AU (50490168)	Oil	507	839	1,389	879	674	1,233	2,255	1,319	49	97	193	106
	Smackover Downdip Continuous Gas AU (50490169)	Gas	Not quantitatively assessed											
	Total Continuous Resources		848	1,597	3,076	1,732	75,302	121,238	203,180	127,922	939	1,980	4,182	2,195
Total Undiscovered Oil and Gas Resources		1,040	2,250	4,429	2,432	79,620	138,695	244,264	147,351	1,117	2,664	5,815	2,961	

eastward into Texas and Louisiana, including the East Texas Basin Province (48), and continues to State waters and onshore lands primarily in Louisiana, Mississippi, Arkansas, and Alabama in the Louisiana-Mississippi Salt Basins Province (49). The TPS also includes Florida and small parts of Oklahoma, Missouri, Illinois, Kentucky, Tennessee, and Georgia (fig. 1). The Florida Peninsula Province (50) was not assessed as part of this study. The Upper Jurassic-Cretaceous-Tertiary Composite TPS contains 34 defined assessment units (AUs) for undiscovered conventional and continuous oil and (or) gas resources (table 1) within Jurassic and Cretaceous strata (fig. 2) that lie predominantly on the coastal plain and in State waters of Texas, Louisiana, Mississippi, Alabama, and a small part of the Florida panhandle.

Resource Summary

The USGS assessment of undiscovered conventional oil and gas resulted in estimated means of 19,429 billion cubic feet of gas (BCFG), 700 million barrels of oil (MMBO), and 766 million barrels of natural gas liquids (MMBGL) in the AUs that were assessed (table 1). For undiscovered continuous oil and gas resources, the estimated means are 127,922 billion cubic feet of gas (BCFG), 1,732 million barrels of oil (MMBO), and 2,195 million barrels of natural gas liquids (MMBGL) in the AUs that were assessed (table 1).

For Additional Information

Supporting geologic studies of Gulf Coast region total petroleum systems and assessment units are in progress, as well as studies of the methodology used in the assessment of both conventional and unconventional resources in Jurassic and Cretaceous strata of the Gulf Coast. Assessment results are available at the USGS Central Energy Resources Science Center Web site: <http://energy.cr.usgs.gov/oilgas/noga>.

Gulf Coast Assessment Team

Russell F. Dubiel (rdubiel@usgs.gov), Peter D. Warwick (pwarwick@usgs.gov), Sharon Swanson (sswanson@usgs.gov), Lauri Burke, Laura R.H. Biewick, Ronald R. Charpentier, James L. Coleman, Troy A. Cook, Kris Dennen, Colin Doolan, Catherine Enomoto, Paul C. Hackley, Alexander W. Karlsen, Timothy R. Klett, Scott A. Kinney, Michael D. Lewan, Matt Merrill, Krystal Pearson, Ofori N. Pearson, Janet K. Pitman, Richard M. Pollastro, Elizabeth L. Rowan, Christopher J. Schenk, and Brett Valentine.

PERIOD	EPOCH	AGE	GROUP OR FORMATION
CRETACEOUS	LATE	Ma 65.5	Navarro Gp. (Escondido Fm.-Olmos Fm.)
		70.6	Taylor Gp. (San Miguel Fm./Anacacho Ls./Ozan Fm./Annona Chalk)
		83.5	Austin Gp./Tokio Fm./Eutaw Fm.
		88.6	Eagle Ford Fm. Woodbine Fm./Tuscaloosa Gp.
	EARLY	99.6	Washita Gp. (Buda Ls.)
			Fredricksburg Gp. (Edwards Ls./Paluxy Fm.)
			Glen Rose Fm. (Rodessa Fm.)
		112	Pearsall Fm.
			Aptian
		125	Sligo Fm. (Pettet Fm.)
			Barremian Hauterivian
		134	Hosston Fm. (Travis Peak Fm.)
JURASSIC	LATE	145.5	Valanginian Berriasian
			Cotton Valley Fm.
		151	Tithonian
	MID.	156	Kimmeridgian
			Haynesville Fm./Gilmer Ls.
		161	Oxfordian
E.	161	Smackover Fm. Norphlet Fm.	
	197	Callovian Bathonian	
TRI. (part)	LATE	200	Louann Salt Werner Fm.
			Hettangian
			Eagle Mills Fm.
			Rhaetian Norian Carnian

Figure 2. Generalized stratigraphic section showing geologic units for which petroleum resources were assessed in the Gulf Coast region. Nomenclature is a combination of formal and informal groups and formation and member names that are based on physical or biostratigraphic correlations in outcrop and subsurface studies. The nomenclature reflects the common designation and usage in the region by State, industry, U.S. Geological Survey, and academic geologists. (TRI., Triassic; E., Early; MID., Middle; Ma, million years ago; Fm., Formation; Gp., Group; Ls., Limestone).